US-PAT-NO: 6313836

DOCUMENT-IDENTIFIER: US 6313836 B1

TITLE: Three dimensional model with three dimensional pointers and multimedia functions linked to the pointers

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Brief Summary Text - BSTX (4):
The advance in computer graphics have extended the range of capabilities for users. Objects or models can now be displayed in three-dimensional ("3-D") representation on a computer-controlled display system, for example, in wireframe, solid, and/or shaded forms. FIG. 1 shows a prior art computer-controlled display system 10 that displays an object 11 in 3-D form.

Brief Summary Text - BSTX (5):
Manipulation of the displayed 3-D objects or models is typically achieved utilizing 3-D or two-dimensional input controllers, such as cursor control devices. The displayed 3-D model can be moved and/or rotated on the display by the input controller. This allows the user to view the 3-D model from various perspective views.

Brief Summary Text - BSTX (13):
A further object of the present invention is to allow a specific view representation (including, specific view orientation, display attribute (e.g., color), geometric transformation (e.g., rotation), and display form (e.g., wireframe)) of a 3-D model annotated with 3-D pointers to

be preserved such
that viewers of the model can communicate with each other with respect to the
model in a consistent environment.

Detailed Description Text - DETX (28):
Control panel 52 includes six control elements that allow the user to select
the type of cursor 29 and display modes of display window 60, etc. For example,
when model 40 is annotated, model 40 can be displayed with or without the
annotating pointers. Control panel 58 includes two control elements, each for
selecting one type of pointer used to annotate 3-D model 40. Again, each of
the control elements of control panel 58 can be selected by placing cursor 29
onto it using control device 27 of FIG. 3. FIGS. 4A-7 only illustrate two
control elements for panel 58. Alternatively, panel 58 may include more than
two control elements. FIGS. 11A through 11C illustrate three different types
of pointers that can be used for pointer 41.

Detailed Description Text - DETX (33):
Control panel 53 includes control elements of recording and playing audio
information. Control panel 54 includes a control element for showing an image.
Control panel 55 includes a control element for playing movie. Control panel
56 includes a control element for automatically recording a combination of
audio, image, and movie information. Each of control panels 53-55 also
includes a control element "Attach" for attaching a respective audio, image, or
movie information to an activated pointer. The information recorded by control
panel 56 can be attached to an activated pointer by the control element
"Attach" of one of control panels 53-55. Control panel 53a includes a control
element to attach a 3-D model file to an activated pointer.

The "Attach" control element in each of control panels 53-56 allows the multimedia file to be attached to the activated pointer. When the "Attach" element is activated, a list of files that are of the same type will be shown. The viewer then can select the needed file to link to the activated pointer.

Detailed Description Text - DETX (42):

If a text is to be attached to pointer 41 when activated, the text can be created in window 64 (as shown in FIG. 5) and then attached to pointer 41. If the text to be attached has already been created under a file name the user can display the file in window 64 and attach the file to pointer 41 using menu bar panel 70.

Other Reference Publication - OREF (2):

Gregory M. Nielson, et al., "Direct Manipulation Techniques for 3D Objects Using 2D Locator Devices," Workshop on Interactive 3D Graphics, pp 175-182, Oct. 23-24, (1986).

US-PAT-NO: 5555366

DOCUMENT-IDENTIFIER: US 5555366 A

TITLE: Computer graphics system for selectively modelling molecules and investigating the chemical and physical properties thereof

---------- KWIC ---------

Detailed Description Text - DETX (6):
In the present invention a user-friendly operator interface is presented on the CRT screen of monitor 13, based on a "windows" format familiar to persons with everyday computer experience. An investigator operates the system by selecting options and initiating actions using input devices such as mouse 19 in conjunction with a cursor displayed on the screen. When an investigator first starts up the system, typically two windows are presented. FIG. 2 shows these two windows, Toolbox 21 and Stockroom 23. The system presents cursor 25 on the display as well, and the cursor is movable over the area of the screen in response to movements of mouse 19, as is known in the art. There are a number of equivalent methods of associating input devices with such a cursor, such as with joysticks or trackballs, among others.

Detailed Description Text - DETX (16):
In the preferred embodiment both two-dimensional and three-dimensional renditions are displayed simultaneously in the 2D/3D workbench window as described above. There may be cases, however, when an investigator wishes to devote his/her entire attention to, for example, the

three-dimensional editor
alone. In the preferred embodiment this contingency is provided by a feature
which allows the user to set the relative size of one window compared to the
other. The two-dimensional window can be made to encompass 90% of the screen,
for example, and the three-dimensional window then encompasses 10%. One window
may also be set to 100%, in which case the user does not see the other window.

Detailed Description Text - DETX (18):
Selecting "2D View" produces a pull-down menu with selections for defaults
in the way two-dimensional representations are made. "2D Tools" provides a
pull-down menu with tool selections for "cleaning up" the two-dimensional
picture. "2D Grid" provides an ability to display a background grid overlying
the two-dimensional display area as an aid in drawing. Selecting "3D View"
produces a pull-down menu with selections for the way the three-dimensional
display is presented. "3D Tools" produces a pull-down menu of tools for use
with three-dimensional editing. "3D style" provides selections for alternative
modes of three-dimensional display, such as Wireframe, Mesh, Dots, Tube,
Ball-and-Tube, and Space Filling. The several display protocols are named by
the way that they display a model, and each protocol has certain advantages
under certain conditions. Wireframe, for example, provides a display as though
the model were made of wire, with joints at atomic centers and straight
sections of wire between representing bonds. Wireframe representation is a
well-known format in computer graphic display of molecules, and in other
three-dimensional applications. Dots, for another example, provides an
indication of the Van der Waals radii of atoms in a molecular structure as

"clouds" surrounding the atomic centers, the extent of the clouds indicating
the relative extent of field effects. Space-Filling shows a molecular
structure with atoms represented as Van der Waals spheres, providing a graphic
display of molecular shape, which is of particular use in studies for which
steric interactions are key, such as docking studies.

Detailed Description Text - DETX (63):
In the preferred embodiment a unique method providing intuitive feedback has
been developed and is used during the distortion of geometry of a model in the
three-dimensional editor. The method imitates situations familiar in many
other activities. When a user selects an object in the editor, the system,
referring to the topology in the data base, determines a set of local
coordinates that the user may perturb using that object. For example, if the
user selects a non-conjugated acyclic bond, the system "knows" that stretching
of the bond and dihedral rotation are the only chemically reasonable motions.
The system displays visible indications called "knurls" to indicate the
available motions to the user.

Detailed Description Text - DETX (96):
FIG. 28A through FIG. 28E show the procedures available to the user and the
system responses for selecting graphical elements in a model and displaying
intuitive knurls for perturbing geometry of a model. The three dimensional
editor of the system of the invention is organized as an object oriented
system, a type known in the art, and the graphical elements are stored by the
system as "objects". In FIG. 28A the procedure of selection and display of
knurls begins at step 285 with the user positioning the cursor over an object

in the model, such as a bond or an atom, and signalling selection, typically by momentary depression of a button on the mouse device.

Detailed Description Text - DETX (106):
Returning to step 295 in FIG. 28A, if the object is not an atom, control passes to step 297, and the system queries whether the selected object is a bond. If so, control goes to (B) in FIG. 28C.

Detailed Description Text - DETX (110):
Returning to FIG. 28A, at step 297, if the selected object is determined not to be a bond, control goes to (C) in FIG. 28D. In step 329 the system queries whether the selected object is a handle. If so, the system maps cursor motion to handle translation (step 331). If the object is not a handle the system questions in step 333 whether it is a spreader knurl (the last of the object possibilities). If not, control returns to waiting for further input. If the selected object is a spreader knurl, the system maps the cursor motion to distortion at step 335.

Detailed Description Text - DETX (226):
In the next step (235) the user selects a distance constraint tool from a pull down menu, and selects two atoms, one on each molecule. The purpose is to impose a distance constraint, and the system displays a dotted line between the two selected atoms after the second atom is selected. After the selection of the two atoms, the system displays a Popup window on the display for entry of a distance constraint to be applied between the two atoms just selected. This is step 237. The Popup window is an entry field, and the user may enter a distance, typically in angstroms. The system also allows the user to enter an

upper and lower tolerance for the constraint, also typically in angstroms. For example, a user may enter 7 angstroms, +2, -1 angstrom. If the user does not enter tolerances the system uses a default tolerance, typically 1/2 angstrom upper and lower.

Other Reference Publication - OREF (5):
Nielson, G. M.; Olsen, D. R., Jr., Proceedings of 1986 Workshop on Interactive Computer Graphics, 1986, 175-182. "Direct Manipulation Techniques for 3D Objects Using 2D Locator Devices".

L Number	Hits	Search Text	DB	Time stamp
1	5629	(345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))	USPAT	2004/01/16 12:10
2	240	((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)	USPAT	2004/01/16 11:50
3	238	(((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)	USPAT	2004/01/16 11:51
4	2	((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe	USPAT	2004/01/16 12:05
8	12	("5365360" | "5398312" | "5428736" | "5485600" | "5586314" | "5592668" | "5737533" | "5894310" | "5926179" | "5956039" | "5973699" | "5999944").PN.	USPAT	2004/01/16 11:59
9	0	(((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe) and stereo near image	USPAT	2004/01/16 12:07
10	0	(((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe) and (stereo near image)	USPAT	2004/01/16 12:09
11	0	(((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe) and stereo$	USPAT	2004/01/16 12:09
12	65	wireframe and ((gui or graphical user interface) near9 window)	USPAT	2004/01/16 12:11
13	49	(wireframe and ((gui or graphical user interface) near9 window)) and ((manipulat$ or control$ or edit$) near9 (image or object))	USPAT	2004/01/16 12:54
14	13	((wireframe and ((gui or graphical user interface) near9 window)) and ((manipulat$ or control$ or edit$) near9 (image or object))) and network$ and server	USPAT	2004/01/16 12:57
15	4	(((wireframe and ((gui or graphical user interface) near9 window)) and ((manipulat$ or control$ or edit$) near9 (image or object))) and network$ and server) and (file near7 image)	USPAT	2004/01/16 12:57

L Number	Hits	Search Text	DB	Time stamp
1	5629	(345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))	USPAT	2004/01/16 12:10
2	240	((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)	USPAT	2004/01/16 11:50
3	238	(((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)	USPAT	2004/01/16 11:51
4	2	((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe	USPAT	2004/01/16 12:05
8	12	("5365360" | "5398312" | "5428736" | "5485600" | "5586314" | "5592668" | "5737533" | "5894310" | "5926179" | "5956039" | "5973699" | "5999944").PN.	USPAT	2004/01/16 11:59
9	0	(((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe) and stereo near image	USPAT	2004/01/16 12:07
10	0	(((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe) and (stereo near image)	USPAT	2004/01/16 12:09
11	0	(((((345/$. ccls. or 707/$.ccls.) and ((file or stor$) near7 (image or object))) and (((control$ or manipulat$) near9 (image or object)) same window)) and (gui or graphical user interface) and (icon or control$)) and wireframe) and stereo$	USPAT	2004/01/16 12:09
12	65	wireframe and ((gui or graphical user interface) near9 window)	USPAT	2004/01/16 12:11
13	49	(wireframe and ((gui or graphical user interface) near9 window)) and ((manipulat$ or control$ or edit$) near9 (image or object))	USPAT	2004/01/16 12:13

Refine Search

Your wildcard search against 10000 terms has yielded the results below.

Your result set for the last L# is incomplete.

The probable cause is use of unlimited truncation. Revise your search strategy to use limited truncation.

Search Results -

Terms	Documents
L9 and ((bitmap or bit map) near7 locat$)	0

Database:
US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L10

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Search History

DATE: Thursday, January 15, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L10	L9 and ((bitmap or bit map) near7 locat$)	0	L10
L9	L1 and (stor$ near7 coordinate) and xyz and uv	39	L9
L8	L6 and (stor$ near9 (image or object))	76	L8
L7	L6 and icon or default	82707	L7
L6	L5 and ((control$ or edit$) near9 (image or object))	90	L6
L5	((gui or graphical user interface) near9 (window or display)) and stereo$ near9 image	133	L5
L4	L2 and stereo$ near9 image	47	L4
L3	L2 and wireframe	2	L3
L2	L1 and (((image or object) near9 (three$dimension$ or 3D)) same	110	L2